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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,180	03/02/2004	Takeshi Arai	501.43537X00	3237

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EXAMINER	
ZERVIGON, RUDY	

ART UNIT	PAPER NUMBER
1792	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/790,180	ARAI ET AL.	
	Examiner	Art Unit	
	Rudy Zervigon	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *5,8,9 and 11-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5,8,9 and 11-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 29, 2007 has been entered.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 5, 11, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukazaki; Hisashi et al. (US 5837094 A) in view of Gupta; Anand et al. (US 6125789 A), Hamelin; Thomas et al. (US 6951821 B2) and Nakano, Hiroyuki et al. (US 20010016430 A1). Tsukazaki teaches an apparatus (Figure 3; column 8, lines 10-67) for processing a sample (1, Figure 3; column 8, lines 10-67), comprising: a processing chamber (4,12, Figure 3; column 8, lines 10-67) provided with a platform (2, Figure 3) on which the sample (1, Figure 3; column 8, lines 10-67) is placed, the processing chamber (4,12, Figure 3; column 8, lines 10-67) being provided with a measurement window (15d, Figure 3; column 1, lines 44-59) formed on a wall surface (12, Figure 3; column 8, lines 10-67); exhaustion means ("booster pump"; column 6, lines 6-11) for exhausting the processing chamber (4,12, Figure 3; column 8, lines 10-67) a gas injector (7, Figure 3; column 8, lines 10-67) for injecting a gas into the processing chamber

(4,12, Figure 3; column 8, lines 10-67); a plasma generator (not shown; column 2, lines 27-36) for generating plasma in the processing chamber (4,12, Figure 3; column 8, lines 10-67) after the gas has been injected into the processing chamber (4,12, Figure 3; column 8, lines 10-67) by the use of the gas injector (7, Figure 3; column 8, lines 10-67) – claim 5

Tsukazaki further teaches:

i. Tsukazaki's particle detector unit (15, Figure 3; column 1, lines 44-59) installed outside of the processing chamber (4,12, Figure 3; column 8, lines 10-67) detecting light which is scattered from a particle (column 3; lines 1-8), the laser (15a, Figure 3; column 1, lines 44-59) introducing a laser from outside of the processing chamber (4,12, Figure 3; column 8, lines 10-67) to inside of the processing chamber (4,12, Figure 3; column 8, lines 10-67) through the measurement window (15d, Figure 3; column 1, lines 44-59) having a reflection prevention film coated thereon; Tsukazaki's particle detector unit (15, Figure 3; column 1, lines 44-59) monitors the light scattered from the particle crossing the plane of the processing window (15c; Figure 3; column 1, lines 44-59) and passing outside of the processing chamber (4,12, Figure 3; column 8, lines 10-67) through the measurement window (15d, Figure 3; column 1, lines 44-59) - claim 5

ii. The apparatus of claim 5, wherein the exhaustion means (12; Figure 3 – see above) enables evacuation of the processing chamber (4,12, Figure 3; column 8, lines 10-67), and the plasma generator generates the plasma after the processing chamber (4,12, Figure 3; column 8, lines 10-67) has been evacuated, as claimed by claim 11 – Applicant's claim requirement of "and the plasma is generated after the processing chamber has been evacuated" is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim

language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

iii. The apparatus (Figure 3; column 8, lines 10-67) according to claim 5, wherein the laser (15a, Figure 3; column 1, lines 44-59) and the detector (15, Figure 3; column 1, lines 44-59) are arranged at a substantially same position outside of the processing chamber (4,12, Figure 3; column 8, lines 10-67) with respect to the measurement window (15d, Figure 3; column 1, lines 44-59) – claim 12

Tsukazaki does not teach that Tsukazaki's particle detector (15, Figure 3; column 1, lines 44-59) *scans* a laser (15a, Figure 3; column 1, lines 44-59) beam in a plane inside of the processing chamber (4,12, Figure 3; column 8, lines 10-67) and outside of a region (4, Figure 3; column 8, lines 10-67) where the plasma is generated (between 7 and 2; Figure 3; column 2, lines 27-36) - claim 8, 13

Tsukazaki further does not teach exhaustion means ("booster pump"; column 6, lines 6-11) for exhausting the processing chamber (4,12, Figure 3; column 8, lines 10-67) by a turbo-molecular pump through an exhaust passage equipped with a butterfly valve – claim 5

Tsukazaki further does not teach that Tsukazaki's measurement window (15d, Figure 3; column 1, lines 44-59) has a reflection prevention film coating, as claimed by claim 5. Likewise,

Tsukazaki further does not teach wherein the reflection prevention film is coated on an outside surface of the measurement window (15d, Figure 3; column 1, lines 44-59) upon which the laser (15a, Figure 3; column 1, lines 44-59) is incident from outside of the processing chamber (4,12, Figure 3; column 8, lines 10-67), as claimed by claim 14.

Gupta teaches a similar apparatus (Figure 1B, 3B) including a scanning (335; Figure 3B) laser system (330, 335; column 8; line 41 – column 9, line 23) for particle detection and processing.

Hamelin teaches a wafer processing system/unit (Figure 2,3) including a vacuum pumping system/unit (280; Figure 2) comprising a mechanical booster vacuum pump, or, equivalently, a turbo-molecular vacuum pump (TMP Figures 2,3; column 9, line 60 – column 10, line 4). Hamelin further teaches a butterfly valve (not shown; column 9, line 60 – column 10, line 4) constituting his vacuum pumping system/unit (280; Figure 2; column 9, line 60 – column 10, line 4).

Nakano teaches a similar substrate processing apparatus (Figure 10) including Nakano's measurement window (11, Figure 10; [0096]) with a reflection prevention film coating that functions to minimize laser reflection, polarization, and entry angle of the incoming laser as taught by Nakano ([0096]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Gupta's laser scanner (335; Figure 3B) to Tsukazaki's particle detector (15, Figure 3; column 1, lines 44-59), and for Tsukazaki to replace his exhaustion means ("booster pump"; column 6, lines 6-11) with Hamelin's exhaustion means (280; Figure 2).

Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add Nakano's measurement window (11, Figure 10; [0096]) reflection prevention film coating to Gupta's measurement window (15d, Figure 3; column 1, lines 44-59).

Motivation to add Gupta's laser scanner (335; Figure 3B) to Tsukazaki's particle detector (15, Figure 3; column 1, lines 44-59) is for detecting particles in a concentrated "volume" as taught by Gupta (column 8; lines 26-40), motivation for Tsukazaki to replace his exhaustion means ("booster pump"; column 6, lines 6-11) with Hamelin's exhaustion means (280; Figure 2) is for conducting processing applications that are "low pressure" as taught by Hamelin (column 9; lines 65-68).

Motivation to add Nakano's measurement window (11, Figure 10; [0096]) reflection prevention film coating to Gupta's measurement window (15d, Figure 3; column 1, lines 44-59) is for minimizing laser reflection, polarization, and entry angle of the incoming laser as taught by Nakano ([0096]).

4. Claims 8, 9, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukazaki; Hisashi et al. (US 5837094 A) in view of Gupta; Anand et al. (US 6125789 A) and Nakano, Hiroyuki et al. (US 20010016430 A1). Tsukazaki and Gupta are discussed above.

Tsukazaki further teaches:

iv. Tsukazaki's particle detector unit (15, Figure 3; column 1, lines 44-59) installed outside of the processing chamber (4,12, Figure 3; column 8, lines 10-67) detecting light which is scattered from a particle (column 3; lines 1-8), the laser (15a, Figure 3; column 1, lines 44-59) introducing a laser from outside of the processing chamber (4,12, Figure 3; column 8, lines 10-67) to inside of the processing chamber (4,12, Figure 3; column 8, lines 10-67) through the

measurement window (15d, Figure 3; column 1, lines 44-59); Tsukazaki's particle detector unit (15, Figure 3; column 1, lines 44-59) monitors the light scattered from the particle crossing the plane of the processing window (15c; Figure 3; column 1, lines 44-59) and passing outside of the processing chamber (4,12, Figure 3; column 8, lines 10-67) through the measurement window (15d, Figure 3; column 1, lines 44-59) - claim 8

v. A plasma processing apparatus (Figure 3; column 8, lines 10-67) control system (31, Figure 3) comprising: a plasma processing unit (Figure 3; column 8, lines 10-67) including a chamber (4,12, Figure 3; column 8, lines 10-67), a plate (2, Figure 3) on which a sample (1, Figure 3; column 8, lines 10-67) is placed, a plasma generator (not shown; column 2, lines 27-36), and a measurement window (15d, Figure 3; column 1, lines 44-59) formed on a wall (12, Figure 3; column 8, lines 10-67) of the chamber (4,12, Figure 3; column 8, lines 10-67), the processing unit (Figure 3; column 8, lines 10-67) being used for processing the sample (1, Figure 3; column 8, lines 10-67) placed on the plate (2, Figure 3) with the plasma generated by the plasma generator (not shown; column 2, lines 27-36) inside the chamber (4,12, Figure 3; column 8, lines 10-67); and a controller unit (31, Figure 3) for receiving a signal output from the processing unit (Figure 3; column 8, lines 10-67) and a detection signal from the particle detecting unit (15, Figure 3; column 1, lines 44-59) to control the processing apparatus (Figure 3; column 8, lines 10-67) and contaminant data - claim 8

vi. The plasma processing apparatus (Figure 3; column 8, lines 10-67) according to claim 8, wherein the controlling unit (31, Figure 3) compares the output signal ("end point"; column 5, lines 56-64; column 7, lines 31-40) from the processing unit (Figure 3; column 8, lines 10-67) with the detection signal by the particle detecting unit (15, Figure 3; column 1, lines 44-59) to

identify a contaminant source in the processing apparatus (Figure 3; column 8, lines 10-67), as claimed by claim 9

vii. The plasma processing apparatus (Figure 3; column 8, lines 10-67) according to claim 8, wherein the particle detecting unit (15, Figure 3; column 1, lines 44-59) includes a laser (15a, Figure 3; column 1, lines 44-59) introduce the laser beam and a detector which which detects the scattered light and which are arranged at a substantially same position outside of the processing chamber (4,12, Figure 3; column 8, lines 10-67) with respect to the measurement window (15d, Figure 3; column 1, lines 44-59) – claim 13

Tsukazaki does not teach that Tsukazaki's particle detector (15, Figure 3; column 1, lines 44-59) scans a laser (15a, Figure 3; column 1, lines 44-59) beam in a plane inside of the processing chamber (4,12, Figure 3; column 8, lines 10-67) and outside of a region (4, Figure 3; column 8, lines 10-67) where the plasma is generated (between 7 and 2; Figure 3; column 2, lines 27-36) - claim 8, 13

Tsukazaki further does not teach that Tsukazaki's measurement window (15d, Figure 3; column 1, lines 44-59) has a reflection prevention film coating. Likewise, Tsukazaki further does not teach wherein the reflection prevention film is coated on an outside surface of the measurement window (15d, Figure 3; column 1, lines 44-59) upon which the laser (15a, Figure 3; column 1, lines 44-59) is incident from outside of the processing chamber (4,12, Figure 3; column 8, lines 10-67), as claimed by claim 15.

Gupta teaches a similar apparatus (Figure 1B, 3B) including a scanning (335; Figure 3B) laser system (330, 335; column 8; line 41 – column 9, line 23) for particle detection and processing.

Nakano teaches a similar substrate processing apparatus (Figure 10) including Nakano's measurement window (11, Figure 10; [0096]) with a reflection prevention film coating that functions to minimize laser reflection, polarization, and entry angle of the incoming laser as taught by Nakano ([0096]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Gupta's laser scanner (335; Figure 3B) to Tsukazaki's particle detector (15, Figure 3; column 1, lines 44-59).

Motivation to add Gupta's laser scanner (335; Figure 3B) to Tsukazaki's particle detector (15, Figure 3; column 1, lines 44-59) is for detecting particles in a concentrated "volume" as taught by Gupta (column 8; lines 26-40).

Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add Nakano's measurement window (11, Figure 10; [0096]) reflection prevention film coating to Gupta's measurement window (15d, Figure 3; column 1, lines 44-59).

Motivation to add Nakano's measurement window (11, Figure 10; [0096]) reflection prevention film coating to Gupta's measurement window (15d, Figure 3; column 1, lines 44-59) is for minimizing laser reflection, polarization, and entry angle of the incoming laser as taught by Nakano ([0096]).

Response to Arguments

5. Applicant's arguments with respect to claims 5, 8, 9, 11-15 have been considered but are moot in view of the new grounds of rejection.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.